



TECHNI-GOLD 25 E S

TECHNI-GOLD 25 ES is a neutral noncyanide gold plating formulation suitable for general, semiconductor, electroforming, or high-speed applications. Without additives, the solution yields soft, bright-to-satin-bright deposits meeting the requirements of Type III A of MIL-G-45204 C (ASTM B488-95 as revised.) The solution can also be used with additives to provide mirror-bright soft or mirror-bright hard deposits having excellent wear resistance.

FORMULATION:

	<u>1 Gallon</u>	<u>25 Gallons</u>
Deionized Water	500 ml	3.3 gallons
TECHNI-GOLD 25 MAKEUP E S	2200 ml	14.5 gallons
TECHNI-GOLD 25 E STABILIZER	20 gm	500 grams
Sodium Sulfite, anhydrous	6 ounces	9 lbs. 6 oz.
Gold as Techni-Gold 25	1-2 troy oz.	2.5-50 t.o.

TANK PREPARATION:

Prior to makeup or installation of the Techni-Gold 25 E S process, tankage and auxiliary equipment must be cleaned and/or leached. Instructions for this process are available from Technic, Inc.

MAKEUP PROCESS:

1. Fill tank partially with deionized or distilled water per formulation requirements. Add required quantity of Techni-Gold 25 Makeup E S and mix thoroughly.
2. Add Techni-Gold 25E Stabilizer with agitation and allow to dissolve completely.
3. Add required amount of sodium sulfite and allow to dissolve completely.
4. Check solution pH. If necessary adjust to pH 6.5-7.0 with Techni-Gold 25 E S pH+ or pH- as needed.
5. Add gold as Techni-Gold 25 Concentrate. Mix thoroughly.
6. Adjust to final volume with deionized water. Continue mixing and raise to operating temperature. The solution is now ready for use.

OPERATING CONDITIONS:

Tankage:	Polypropylene, fiberglass, or glass.
pH:	6.5-7.5 (optimum 7.0-7.5)

Specific Gravity: 10° Baumé minimum
Anodes: Platinized. Anode-to-cathode area ratio should be at least 1:1

Temperature: 120-160° F (optimum 140° F)
Heaters: Low power density heaters are preferred. Localized boiling of solution should be avoided.

Agitation: Moderate to vigorous.
Current Density: 1-8 ASF (rack) Higher if agitation permits.
1-4 (barrel)

REPLENISHMENT:

Add one troy ounce gold as Techni-Gold 25 every 4 ampere-hours.

pH ADJUSTMENT:

pH of Techni-Gold 25 E S may be raised if necessary with Techni-Gold 25 E S pH+, or with a 20-40% solution of sodium hydroxide.

pH of Techni-Gold 25 E S may be lowered if necessary with Techni-Gold 25 E S pH-.

SPECIFIC GRAVITY:

The specific gravity of Techni-Gold 25 E S tends to rise slowly in use. Depending on application, the solution can be used at specific gravities up to about 30 degrees Baumé.

ADDITIVE A:

Techni-Gold 25 Additive A is an arsenic-containing additive which can be used to increase the overall deposit brightness without significant increase in deposit hardness or loss of current efficiency. Normal dosage levels are from about 5-30 parts per million. Addition of 10 grams Techni-Gold 25 Additive A per gallon of plating solution provides a concentration of 30 ppm arsenic.

ADDITIVE E:

Techni-Gold 25 Additive E is an organic brightening agent which can be used to increase both brightness and hardness of the deposit. Normal dosage is 5-10 milliliters per U.S. gallon, in which range the Additive functions primarily as a brightener only.

ADDITIVE E S:

Techni-Gold 25 Additive E S is a combination of arsenic with organic brightening agents. Additive E S causes the deposit to become highly leveling (i.e., to increase in brightness with

increasing thickness.) It is particularly useful in obtaining heavy deposits, and for electroforming.

SULFITE:

The free sodium sulfite content of Techni-Gold 25 ES tends to decrease slowly over time (weeks to months). In order to maintain chemical stability of the solution the sulfite content should be analyzed periodically and adjusted as necessary. An analytical method for sulfite is shown as follows. The nominal concentration of sulfite in the plating solution (as anhydrous Na₂SO₃) is 6 ounces per gallon. (45 grams per liter.) When replacing sodium sulfite to the bath it is useful to add 2-3 grams of Techni-Gold 25 E Stabilizer per ounce of anhydrous sodium sulfite replenished.

ANALYSIS FOR SODIUM SULFITE IN TECHNI-GOLD 25 E S

Reagents:

1. 0.1 N Iodine
2. Starch indicator solution

Procedure:

1. Pipette 5 ml of sample into a 1 liter Erlenmeyer flask.
2. Dilute to 500 ml with distilled water.
3. Add 5 ml of starch indicator solution.
4. Titrate with 0.1 N Iodine to a faint blue endpoint (stirring constantly).

Calculation:

Mls. of 0.1 N Iodine x 0.1683 = oz./gal. of Sodium Sulfite



Free sodium Sulfite in this solution should be maintained at 4 ounces per gallon minimum.

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ANALYSIS FOR STABILIZER IN TECHNI-GOLD 25 E S

Equipment:

Spectrophotometer capable of absorbance measurement at wavelength of 266 nm.

Quartz cuvette.

Procedure:

- 1. Pipet 2 ml of plating solution to a 500 ml volumetric flask. Fill to mark with DI water.**
- 2. Using a clean cuvette, determine the absorbance of DI water at 266 nm. This is the blank value.**
- 3. In the same cuvette determine the absorbance of the diluted solution at 266 nm.**
- 4. Subtract the blank from the sample absorbance.**
- 5. Use this net absorbance to determine the stabilizer concentration from the attached curve.**
- 6. Useable stabilizer range is 10-30 gm/gal of solution. Optimum range is 15-25 gm/gal.**

**Stabilizer Dissolved in TG 25 E S
1:250 dilution in DI water.**

